

Using dispersion relationships for finite length PhC waveguides characterisation

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A numerical procedure for characterise finite length PhC waveguides is presented. This characterisation is achieved by using 1) the dispersion relationship of the guided mode for the infinite waveguide and 2) the transmission and reflection coefficients at the input and output interfaces of this waveguide [1]. This procedure allows achieving very accurate results when propagating pulses in these finite length waveguides (even at the band edge), with a huge time and resources saving compared to FDTD simulations.

This procedure will be used to analyze the influence of the parameters that define the waveguide (such as its length or its termination at the interfaces) over the total output pulse shape and parameters. The main effect analyzed in this work will be the effect of the non-perfect coupling at the access ports over the output pulse.

- [1] P. Sanchis, P. Bienstman, B. Luyssaert, R. Baets, and J. Martí, *IEEE J. Quantum Electron.*, **40**, pp. 541-550 (2004).